

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

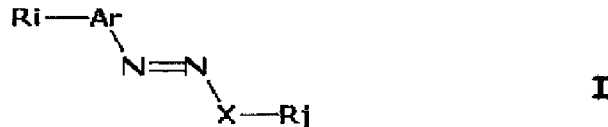
1-38 (canceled)

39. (currently amended) ~~Photosensitive~~ A photosensitive adhesive composition of polymerizable resin type whose hardening is obtained by polymerization and/or cross-linking characterized in that said composition contains:

- ~~means for initiating~~ at least one chain polymerization reaction initiator that ensures in order to ensure hardening of said composition, and

- a sufficient quantity of at least one bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit selected from the group consisting of:

(i) aryl-diazos units defined by formula I:



in which:

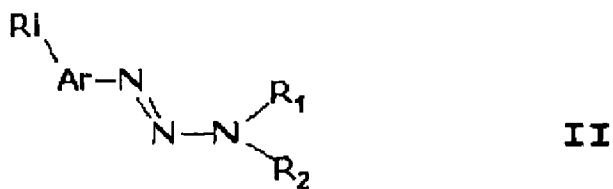
- Ar designates an aromatic system, monocyclic or polycyclic, carbocyclic or heterocyclic,

- X designates an atom chosen from among: C, O, P, S;

- Ri is one or more of the following groups: hydrogeno, halogeno, alkyl linear or branched, saturated or unsaturated, optionally substituted, aryl aromatic or heteroaromatic, substituted or unsubstituted, alkoxy comprising at least one selected from the group consisting of methoxy, ethoxy, aryloxy, alkylthio, arylthio, benzyl, halogeno, hydroxy, hydroxyalkyl, thiol, alkoxy carbonyl, aryloxy carbonyl, cyano, carbonyl, formyl, amino, carboxylic and sulfonic ester, carboxylic sulfonic and phosphoric amide, carboxylic sulfonic and phosphoric acid, sulfonate, phosphonate, -CONR'R'' group, -OCO₂R', -OSO₂R', -OPOOR'OR'', -R'NHCOOR'', -R'OCO₂R'', -NR'R'' (in which R' and R'' represent an alkyl group, carbocyclic or heterocyclic group, aliphatic, unsaturated, (hetero-)aromatic group, all substituted or unsubstituted, imine whether substituted or not, nitro, -N=N-R', -R_p-Si-(OR_q)₃ group (in which R_p is a hydrocarbon chain or a linear alkyl chain comprising at least 3 C atoms, and R_q denotes a hydrogen atom, a hydroxy group, C₁-C₆ alkoxy chain or - (Si(OR_q) group), vinyl group, acrylic group, alkoxy carbonyl group, and an aryl triazene group,

- Rj designates one or more substituents depending upon the valency of the atom designated by X, the same or different and chosen from among: an alkyl chain linear or branched, saturated or unsaturated, acyclic or cyclic, optionally substituted; an aromatic or heteroaromatic group including, at least one nitrogen or sulfur atom, monocyclic or polycyclic; an alkoxy, aryloxy chain or benzyl group;

(ii) aryl-triazene units defined by formula II:

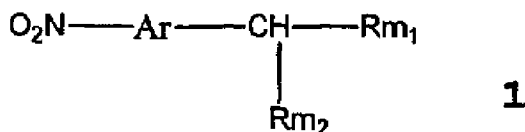


in which:

- Ar designates an aromatic system monocyclic or polycyclic, carbocyclic or heterocyclic,
- Ri is chosen from among the following groups: alkyl linear or branched, saturated or unsaturated, optionally substituted, aryl aromatic or heteoaromatic, substituted or unsubstituted, alcoxy comprising one selected from the group consisting of methoxy, ethoxy, aryloxy, alkylthio, arylthio, benzyl, halogeno, hydroxy, hydroxyalkyl, thiol, alkyloxycarbonyl, aryloxycarbonyl, cyano, carbonyl, formyl, amino, carboxylic and sulfonic ester, carboxylic sulfonic and phosphoric amide, carboxylic sulfonic and phosphoric acid, sulfonate, phosphonate, -CONR'R'' group or -OCO₂R', -OSO₂R', -OPOOR'OR'', -R'NHCOOR'', -R'OCO₂R'', -NR'R'' (in which R' and R'' represent an alkyl group, a carbocyclic or heterocyclic group, aliphatic, unsaturated, a (hetero-)aromatic group, all substituted or unsubstituted, imine substituted or unsubstituted, nitro, -N=N-R', -Rp-Si-(ORq)₃ group (Rp and Rq as previously defined above), a vinyl group, acrylic group, alcoxycarbonyl group, and an aryltriazene group,
- R₁ and R₂ are chosen independently from one another, a -N=N-R' group, -NR'-N=N-R'' group, OH group, NR'R'' group, (R' and R'' have the previously given denotations), an alkyl group comprising at least one selected from the group consisting of methyl, ethyl, propyl,

isopropyl, butyl, tert-butyl, an alcoxy group substituted or not, a benzyl group, a (hetero)-aromatic group, all substituted or not by substituents of Ri type, a hydroxyethyl, cyanoethyl, aminoethyl, acryloxyethyl, and halogenoethyl group

(iii) 2-nitrobenzyl units having the formula 1:



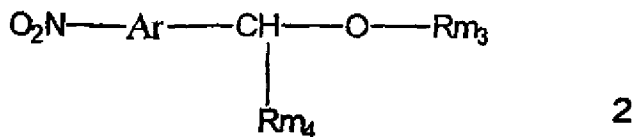
in which:

- Ar designates an aromatic or heteroaromatic radical monocyclic or polycyclic and carrying at least one Rk substituent,
- Rk designates an auxochromic or bathochromic substituent which may be chosen from the following examples: hydrogen, halogen, alkyl chain, aliphatic acyclic saturated or unsaturated, linear or branched, a cyclic, aliphatic, unsaturated, aromatic or heteroaromatic radical, these chains and radicals possibly being substituted, interrupted or terminated by a heteroatom comprising at least one selected from the group consisting of B, N, O, Si, P, S and a halogen, a nitro group, cyano group, an alcoxy, aryloxy, alkylthio, arylthio, benzyl, alylalkyl, hydroxy, thiol, alkyloxycarbonyl, aryloxycarbonyl, carbonyl, formyl, amino radical, carboxylic ester, amide, sulfonic ester, sulfonic amide, carboxylic acid, sulfonic acid, sulfonate, phosphonate, a -OCONR'R'' group, -OCO₂R', -OSO₂R', -OPOOR'OR'', -R'NHCOOR'', R'OCO₂R'', NR'R'' (R' and R'' are an alkyl, aryl group, a carbocyclic or heterocyclic group), imine substituted

or unsubstituted, diazo -N=N-R', -Rp-Si(ORq)₃ group (Rp and Rq as defined in claim 3), alkylglycidyl ether, alkylvinyl ether, cyclohexyl epoxy,

- R_{m1}/R_{m2} are independently chosen from among: a hydrogen, an alkyl, alkenyl, alcyanyl, alkylaryl chain, all substituted or unsubstituted, a carbocyclic or heterocyclic chain saturated or unsaturated, aromatic or heteroaromatic, substituted or unsubstituted, an alkoxy, aryloxy, alkylthio, arylthio chain, an alkyloxocarbonyl group, -NR'COR'' group, -OCOR' group, -OCOOR' group, -OCONR'R'' group, NR'COOR'' group, -OPOR'R''R''' group, -OSO₂R' group, -OPOOR'OR'' group, -NR'R'', -COOR'group, -CONR'R'', SOOR', -COR' group (R', R'' and R''' have the previously indicated denotations for R' and R''), an imine group substituted or unsubstituted, a hydroxy, thiol group, a carboxylic acid or derivative of carboxylic acid, a halogen, a nitrile, an alkyl(C1-C6)glycidyl ether group, alkyl(C1-C6)vinyl ether group, cyclohexyl epoxy, -Rp-Si-(ORq)₃ group (Rp and Rq as previously defined above)

(iv) 2-nitrobenzyl units defined by formula 2:



in which:

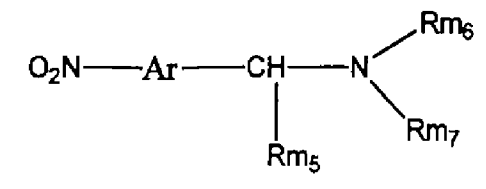
- Ar is as defined in claim 9,

- R_{m4} is defined as R_{m1}/R_{m2} in claim 9,

- R_{m3} is chosen from among a hydrogen, an alkyl, alkenyl,

alcynyl, alkylaryl chain, all substituted or unsubstituted,
interrupted by a heteroatom, a carbocyclic or heterocyclic chain,
saturated or unsaturated, aromatic or heteroaromatic, substituted or
unsubstituted, an alkyloxocarbonyl group, NCOOR' group, -POR'R''R'''
group, -SO₂R' group, -POOR'OR'' group, -COOR' group, -CONR'R'', COR'
group (R', R'' and R''' having the previously indicated denotations
for R' and R'' in claim 9), an alkyl(C₁-C₆)glycidyl ether group,
alkyl(C₁-C₆)vinyl ether group, cyclohexyl epoxy, -R_p-Si(OR_q)₃ group
(R_p and R_q as previously defined above),

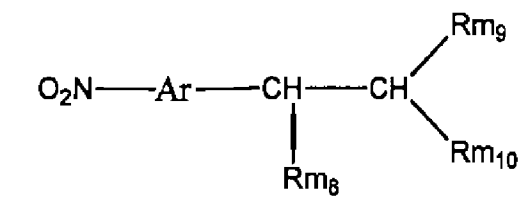
(v) 2-nitrobenzyl units defined by formula 3:



in which:

- Ar is defined as previously,
- R_{m5} is defined as R₁₁/R₁₂/R₁₃,
- R_{m6}/R_{m7} are defined as a hydrogen, an alkyl, alkenyl, alcynyl,
alkylaryl chain, substituted or not, interrupted by a heteroatom, a
carbocyclic or heterocyclic chain, (un)saturated, (hetero)-aromatic,
substituted or not, an alkyloxycarbonyl group, -R'COR'' group,
R'COOR'' group, R'R'', -COOR' group, -CONR'R'', a COR' group (R' and
R'' having the denotations previously given), a hydroxy group,
alkyl(C₁-C₆)glycidyl ether or alkyl(C₁-C₆)vinyl ether, cyclohexyl
epoxy, -R_p-Si(OR_q)₃ group (R_p and R_q as defined previously above), and

(vi) 2-nitrobenzyl units defined by formula 4:



in which:

- Ar is defined as previously,
 - $\text{R}_{\text{m}8}/\text{R}_{\text{m}9}/\text{R}_{\text{m}10}$ are defined as $\text{R}_{11}/\text{R}_{12}/\text{R}_{13}$ as defined above; and
- secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre so that said hardened composition loses its integrity and adhesiveness under the action of uncrosslinking radiation which causes cleavage of the photocleavable units.

40. (currently amended) Adhesive—The adhesive composition as in claim 39 characterized in that, wherein the initiation means for chain polymerization reaction(s) are photoinitiating means consisting of at least one photoinitiator able to initiate the polymerization reaction mechanism under the action of crosslinking radiation whose wavelength λ_1 is different to wavelength λ_2 for uncrosslinking radiation.

41. (cancelled)

42. (currently amended) Adhesive—The adhesive composition as in

claim ~~4139~~, ~~characterized in that~~ wherein X designates P and in that the photocleavable unit(s) of the photocleavable centre are arylazophosphonate units $\text{Ar-N=N-PO(OR') (OR'')}$, in which R' and R'' are independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, ~~more particularly~~ a hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethyl, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C₁-C₆)glycidyl or alkyl(C₁-C₆)vinyl, cyclohexyl epoxy.

43. (currently amended) Adhesive ~~The adhesive composition as in claim 4139, characterized in that~~ wherein X designates S and in that the photocleavable unit(s) of the photocleavable centre are arylazosulfonates $\text{Ar-N=N-So(OR') (OR'')}$, R' and R'' being independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, ~~more particularly~~ a hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethyl, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C₁-C₆)glycidyl or alkyl(C₁-C₆)vinyl, cyclohexyl epoxy.

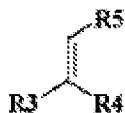
44. (currently amended) Adhesive ~~The adhesive composition as in claim 4139, characterized in that~~ wherein X designates S and in that the photocleavable unit(s) of the photocleavable centre are arylazosulfone units $\text{Ar-N=N-SO}_2\text{R'}$, R' being independently chosen from

among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, ~~more particularly a~~ hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethy, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C₁-C₆)glycidyl or alkyl(C₁-C₆)vinyl, cyclohexyl epoxy.

45. (currently amended) ~~Adhesive~~ The adhesive composition as in claim 41-39, characterized in that wherein X designates S and in that the photocleavable unit(s) of the photocleavable centre are arylazosulfide units AR-N=N-S-R', R' being independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, ~~more particularly a~~ hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethy, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C₁-C₆)glycidyl or alkyl(C₁-C₆)vinyl, cyclohexyl epoxy.

46-48. (cancelled)

49. (currently amended) ~~Composition~~ The adhesive composition as in claim 39, characterized in that wherein the polymerizable units to linked to the photocleavable units to form of the bifunctional monomer are radically polymerizable and are vinyl groups defined by formula IV:



in which R3, R4, R5 are substituents able to activate together the double vinyl bond vis-à-vis radical addition chain reactions, at least one of said substituents being a hydrocarbon chain advantageously a C1-C6 alkyl chain.

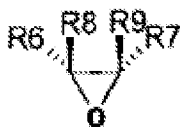
50. (currently amended) Composition ~~The adhesive composition~~ as in claim 49, ~~characterized in that~~ wherein at least one of the substituents R3, R4 and R5 is chosen from among the groups: aryl, carbonyloxyalkyl, carbonyloxyaryl, carboxy (-COOH), alkoxy-carbonyl (-O₂CR), carbamoyl (-CONR₂) and cyano.

51. (currently amended) Composition ~~The adhesive~~ as in claim 40, ~~characterized in that~~ wherein said composition comprises at least two types of complementary vinyl units, capable of creating a charge transfer complex (electron donor/acceptor pair) itself able to initiate a radical reaction under the action of crosslinking radiation of wavelength λ_1 , or at least one type of acceptor vinyl unit able to create a charge transfer with another complementary species.

52. (currently amended) Composition ~~The adhesive composition~~ as in claim 51, ~~characterized in that~~ wherein the donor vinyl unit is chosen

from among the elements: styrene, vinyl acetate, vinyl ether, exomethylene dioxolane ~~in particular,~~ 4-methylene-2-phenyl-1,3-dioxolane, alkyl methacrylate, vinyl pyrrolidone, vinyl carbazole, vinyl naphthalene, while the vinyl unit of acceptor type is chosen from among the elements: maleic anhydride, acrylonitrile, diethyl fumarate, fumaronitrile, maleimides.

53. (currently amended) ~~Composition~~ The adhesive composition as in claim 3839, characterized in that wherein the polymerizable units to be linked to the photocleavable units to form of the bifunctional monomer are ~~cationically~~ radically polymerizable and are oxirane groups defined by formula V:

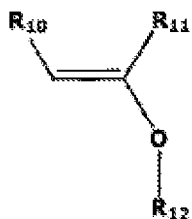


in which at least one of the substituents R6, R7, R8, R9 is a hydrocarbon chain and are chosen from among a hydrogen atom, halogen atom, an alkyl, alkoxy, alkylthio chain linear or branched, saturated or unsaturated, acyclic or cyclic, ~~preferably C1-C6,~~ optionally substituted, optionally interrupted by a heteroatom, an aromatic or heteroaromatic aryl group, an aryloxy or arylthio group ~~preferably having 5 to 6 atoms,~~ a benzyl group, imine group, amino NR'R'', SiR'R''R''', alkyl(C1-C6)oxycarbonyl, aryl(C1-C6)oxycarbonyl, amide, carboxylic and sulfonic ester, sulfonate, phosphonate, a carbonyl group, cyano, -CONR'R'' group, -OCO₂R' group, -OSO₂R' group, -

OPOOR'OR'' group, -R'NHCOOR'', R'OCO₂R'' in which R, R', R'' represent an alkyl group ~~(preferably C₁-C₆)~~ substituted or unsubstituted, aryl ~~(preferably having 5 to 6 atoms)~~, carbocyclic or heterocyclic group, aliphatic, unsaturated or aromatic, substituted or unsubstituted.

54. (currently amended) Composition ~~The adhesive composition as in claim 53, characterized in that~~ wherein, for reasons of steric hindrance, two of the substituents R₆, R₇, R₈, R₉ are a hydrogen atom.

55. (currently amended) Composition ~~The adhesive composition as in claim 39, characterized in that~~ wherein the polymerizable units to be linked to the photocleavable units to form ~~of the bifunctional monomer are cationically radically polymerizable and are vinyl ethers defined by formula VI:~~



in which:

- R₁₀ and R₁₁ are the same or different and designate a hydrogen atom or advantageously a linear or branched C₁-C₆ alkyl chain, substituted or not, saturated or unsaturated, acyclic or cyclic, optionally interrupted by a heteroatom ~~such as O, N, Si, P~~ for example, an aromatic or heteroaromatic aryl group ~~(preferably~~

~~having 5 to 6 atoms), an alkoxy chain (preferably C₁-C₆), alkylthio chain (preferably C₁-C₆), arylthio (preferably having 5 to 6 atoms).~~

- R12 advantageously designates a linear or branched C₁-C₆ alkyl chain, substituted or not, saturated or unsaturated, acyclic or cyclic, optionally interrupted by a heteroatom ~~such as O, N, S, Si, P for example~~, an aromatic or heteroaromatic aryl group ~~(preferably having 5 to 6 atoms).~~

56. (currently amended) Composition ~~The adhesive composition~~ as in claim 39, ~~characterized in that~~wherein the bifunctional monomer is of oligomer or prepolymer size and has a comb branch structure, consisting of a principal linear polymer chain of which each of the comb branches contains at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned at the free end of the branch.

57. (currently amended) Composition ~~The adhesive composition~~ as in claim 56, ~~characterized in that~~wherein the comb branches contain a photocleavable unit and a polymerizable unit.

58. (currently amended) Composition ~~The adhesive composition~~ as in claim 39, ~~characterized in that~~wherein the bifunctional monomer is of oligomer or prepolymer size and has a hyperbranched structure.

59. (currently amended) Composition ~~The composition~~ as in claim 58, ~~characterized in that~~wherein the bifunctional monomer with hyperbranched structure is synthesized from a precursor monomer of AB₂

or AB₃ type, ~~in particular~~ under a polycondensation or polyaddition mechanism.

60. (currently amended) Adhesive The adhesive composition as in claim 58, ~~characterized in that~~wherein the hyperbranched structure has a core comprising photocleavable units, and a peripheral shell consisting of inert units from a photochemical viewpoint.

61. (currently amended) Adhesive The adhesive composition as in claim 58, ~~characterized in that~~wherein the hyperbranched structure has a core consisting of photochemically inert units, and a peripheral shell containing photocleavable units.

62. (currently amended) Adhesive The adhesive composition as in claim 49, ~~characterized in that~~wherein the bifunctional monomer is 1,5-bis[4'-(methacryloylmethyl)phenylazomethyl-phosphonate]-diethylene glycol.

63. (currently amended) Adhesive The adhesive composition as in claim 53, ~~characterized in that~~wherein the bifunctional monomer is: 1,5-bis[4'-methyl glycidyl ether)phenylazomethylphosphonate]-diethylene glycol.

64. (currently amended) Adhesive The adhesive composition as in claim 49, ~~characterized in that~~wherein the bifunctional monomer is chosen from: 1,2-Bis[1-(4'-(methacryloylmethyl)-)phenyl-3-methyl]triaz(1)ene-ethane; 1,2-Bis[1-(4'-(methacryloylethyl)

aminocarbonyloxymethyl)phenyl-3-methyl-]triaz(1)ene-ethane;
1-(4'-methacryloylmethyl-) phenyl-3-(2''-methacryloylethyl)-3-
methyl-triaz(1)ene; 1-(4'-(methacryloylethyl)aminocarbonyl
oxymethyl)phenyl-3-((methacryloylethyl) aminocarbonyloxyethyl) -3-
methyl-triaz(1)ene;
1-(4'-methacryloylmethyl-)phenyl-3,3-di(2''-methacryloylethyl) -
triaz(1)ene; 1-(4'-(methacryloylethyl)aminocarbonyl oxymethyl)phenyl-
3,3-di(((methacryloylethyl)aminocarbonyl oxyethyl)-triaz(1)ene; 1-
(3'-methacryloylethyl carboxyphenyl)-3-di(2''-
methacryloylethyl)triaz(1)ene; or 1,2-Bis[1-(3''-
methacryloylethylcarboxyphenyl)-3-methyl]triaz(1)ene-ethane; 2-
methacryloylmethyl-5-(3'-(2''methacryloylethyl)-3'-
methyl)triaz(1)ene-thiophene.

65. (currently amended) Adhesive ~~The adhesive~~ composition as in
claim 53, ~~characterized in that~~ wherein the bifunctional monomer is
chosen from among: 1-(3'-ethyl glycidyl ether carboxyphenyl)-3-(ethyl
glycidyl ether)-3-methyl-triaz(1)ene, 1-(3'-ethyl glycidyl ether
carboxy-6'-methylphenyl)-3-(ethyl glycidyl ether)-3-methyl-
triaz(1)ene; or 1-(4'methyl glycidyl ether)-3-(ethyl glycidyl ether)-
3-methyl-triaz(1)ene.

66. (currently amended) Adhesive ~~The adhesive~~ composition as in
claim 49, ~~characterized in that~~ wherein the bifunctional monomer is
chosen from: 2-Methyl-acrylic acid 5-methoxy-4-[2-(2-methyl-
acryloyloxy)-ethoxy]-2-nitro-benzyl ester; 2-Methyl-acrylic acid 1-
(5-methoxy-4-[2-methyl-acryloyloxy)-ethoxy]-2-nitro-phenyl)-ethyl

ester; 2-Methyl-acrylic acid 4,5-bis-[2-(2-methylacryloyloxy)-ethoxy]-2-nitro-benzyl ester; or 2-Methyl-acrylic acid 2-(5-methoxy-4-(2[2-(2-methyl-acryloyloxy)-ethoxycarbonyloxy]-ethoxy)-2-nitro-benzloxycarbonyloxy)-ethyl ester.

67. (currently amended) Adhesive The adhesive composition as in claim 53, ~~characterized in that~~wherein the bifunctional monomer is chosen from among: 2-[2'-nitro-4',5'-di(oxymethyloxirane)]benzyloxymethyl oxirane; or (2-Methoxy-5-nitro-4-oxiranylmethoxymethyl-phenoxy)-acetic acid oxiranylmethyl ester.

68. (currently amended) Adhesive The adhesive composition as in claim 56, ~~characterized in that~~wherein the bifunctional monomer is chosen from:

- Poly[(14-(2'-aminoacylethyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(2'-4'-aminoacylethyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly[(14-(4'-aminoacylhexyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-aminoacylhexyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly[(14-(4'(4''-aminoacylphenyl)methylphenyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-(4''-aminoacylphenyl)methylphenyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly[(14-(4'-(4''-aminoacylcyclohexyl)methylcyclohexyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-(4''-aminoacylcyclohexyl)methylcyclohexyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly((14-(4'-methylaminoacylcyclohexyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-methylaminoacylcyclohexyl)-1,4-dioxa-5-oxo-aza-heptane)], or

- Poly[(14-(4'-aminoacylbutyl-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-aminoacylbutyl)-1,4-dioxa-5-oxo-6-aza-heptane)]

in which all these polymers are esterified on the hydroxy group at position 6 of the copolymer chain by groups of type:

- -oxycarbonyl-3-[3'-(2''-(methacrylate)ethyl)-3'-methyl-triazene]phenyl, and/or
- oxycarbonyl-ethyloxy-(1-methoxy-3-(methacrylatemethyl)-4-nitro)phenyl.

69. (currently amended) Adhesive ~~The adhesive composition as in claim 60, characterized in that~~ wherein the bifunctional monomer is chosen from among:

- Poly(1-(3'-carboxyphenyl)-3-,3-di(2''hydroxyethyl)triazene),
- Poly(1-(3'-carboxy-6'-methylphenyl)-3-,3-di(2''-hydroxyethyl)triazene)
- Poly(1-(4'-carboxyphenyl)-3-,3-di(2''-hydroxyethyl)triazene),
- Poly(1-(3',5'-dicarboxyphenyl)-3-(2''-hydroxyethyl)-3-methyl - triazene),
- Poly(1-(3'-carboxyphenyl)-3-,3-di(2''-hydroxyethyl)triazene-co-2,2-bis(hydroxymethyl)propionic acid),
- Poly(1-(3'-carboxy-6'-methylphenyl)-3-,3-di(2''-hydroxyethyl)triazene-co-2,2-bis(hydroxymethyl)propionic acid), or
- Poly(1-(4'carboxyphenyl)-3-,3-di(2''hydroxyethyl)triazene-co-2,2-bis(hydroxymethyl)propionic acid),

~~ω~~-functionalized by methacrylate ends with methacrylic acid and its derivatives, comprising one chosen from ~~such as~~ 2-hydroxyethylmethacrylate, glycidyl methacrylate or 2-isocyanatoethyl methacrylate ~~for example~~, or oxirane ends of glycidyl type by reaction with an epihalohydrine ~~for example~~.

70. (currently amended) Adhesive ~~The adhesive~~ composition as in claim 61, ~~characterized in that~~ wherein the bifunctional monomer is chosen from among:

- Poly(2,2-bis(hydroxymethyl)propionic acid -co-1-(3'-carboxy phenyl)-3-,3-di(2''-hydroxyethyl)triazene),
- Poly(2,2-bis(hydroxymethyl)propionic acid -co-(3'-carboxy-6'-methyphenyl)-3-,3-di(2''-hydroxyethyl)triazene),
- ~~ω~~-functionalized by methacrylate ends with methacrylic acid and its derivatives, ~~such as comprising one chosen from~~ 2-hydroxyethylmethacrylate, glycidyl methacrylate or 2-isocyanatoethyl methacrylate ~~for example~~, or by oxirane ends of glycidyl type by reaction with an epihalohydrine ~~for example~~, or
- Poly(2,2-bis(hydroxymethyl)propionic acid),
~~ω~~-functionalized by an oxycarbonyl-3-[3'-(2''-(meth acrylate)ethyl))triazene]phenyl group or an -oxycarbonyl-ethyl oxy-(1-methoxy-3-(methacrylatemethyl)-4-nitro)phenyl group.

71. (currently amended) Adhesive ~~The adhesive~~ composition as in claim 40, ~~characterized in that~~ wherein the photoinitiation means for radical or cationic polymerization reaction comprise at least one species able to cause their photo-sensitization.

72. (currently amended) Adhesive ~~The adhesive~~ composition as in claim 40, ~~characterized in that~~ wherein the photoinitiation means for radical polymerization reaction also comprise a co-initiator.

73. (currently amended) Adhesive ~~The adhesive~~ composition as in claim 72, ~~characterized in that~~ wherein the photoinitiation means for radical polymerization reaction consist of the following

photoinitiator/co-initiator pair: camphorquinone / tertiary amine.

74. (currently amended) Adhesive ~~The adhesive~~ composition as in claim 40, ~~characterized in that~~ wherein the photoinitiation means for radical polymerization reaction consist of a photoinitiator which is a bis-acyl of phosphine oxide.

75. (currently amended) Adhesive ~~The adhesive~~ composition as in claim 39, ~~characterized in that~~ wherein the initiation means of the chain polymerization reaction(s) are of chemical type.

76. (currently amended) Bifunctional ~~A bifunctional~~ monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, ~~characterized in that it~~ wherein said bifunctional monomer is of oligomer or prepolymer size and has a comb branched structure consisting of a principal linear polymer chain of which each of the comb branches contain at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned on the free end of the branch, the photocleavable units being chosen from the aryldiazos defined in claim ~~41-39~~ 39 by formula I.

77. (allowed - currently amended) Bifunctional ~~A bifunctional~~ monomer including firstly a photocleavable centre comprising at least

one photocleavable unit and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, ~~characterized in that it~~wherein said bifunctional monomer is of oligomer or prepolymer size and has a hyperbranched structure obtained by polycondensation or polyaddition of precursor monomers of AB₂ or AB₃ type.

78. (allowed - currently amended) ~~Bifunctional~~The bifunctional monomer as in claim 77, ~~characterized in that~~wherein the hyperbranched structure has a core consisting of photocleavable units and a peripheral shell consisting of inert units from a photochemical viewpoint.

79. (allowed - currently amended) ~~Bifunctional~~The bifunctional monomer as in claim 77, ~~characterized in that~~wherein the hyperbranched structure has a core consisting of photochemically inert units, and a peripheral shell comprising photocleavable units.

80. (currently amended) ~~Method~~A method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit chosen from among the aryltriazenes defined in claim ~~46~~39 by formula II, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprising a synthesis step of the photocleavable centre, a

structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, ~~characterized in that~~wherein the synthesis step of an ayltriazene photocleavable unit consists of:

- conducting diazotation in inert organic medium in the presence of a Lewis acid of type BF_3 or PF_3 or SbF_3 and of an organic nitrite,

- then conducting diazoic coupling by adding a compound comprising at least one primary or secondary amino group, in a dissociating organic medium in the presence of a mineral compound of sodium carbonate, potassium carbonate or sodium hydrogenocarbonate type.

81. (allowed - currently amended) ~~Method~~A method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, ~~characterized in that it~~wherein said method comprises a creation step to create polymerizable units of vinyl type on the photocleavable centre, consisting of the creation of acryloyl functions by nucleophilic substitution on an acryloyl carbon.

82. (allowed - currently amended) Method ~~A method~~ for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, ~~characterized in that it~~ wherein said method comprises a grafting step to graft vinyl type polymerizable units onto the photocleavable centre, consisting of grafting the vinyl function included in a molecule comprising at least one reactive function (F1) onto the chemical skeleton of the photocleavable centre, and also comprising at least one other reactive function (F2), by causing these two functions to react via a nucleophilic substitution mechanism on an acyl type carbon.

83. (allowed - currently amended) Method ~~The method~~ as in claim 82, ~~characterized in that~~ wherein one of the two reactive functions (F1, F2) is an OR group or an -OOCR group.

84. (allowed - currently amended) Method ~~A method~~ for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site

or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, ~~characterized in that it~~wherein said method comprises a grafting step to graft vinyl type polymerizable units onto the photocleavable centre, consisting of grafting the vinyl function included in a molecule comprising at least one reactive function (F1) onto the chemical skeleton of the photocleavable core, and also comprising at least one other reactive function (F2), by causing these two functions (F1, F2) to react to form a carbamate bond.

85. (allowed - currently amended) ~~Method~~A method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, ~~characterized in that it~~wherein said method comprises a grafting step to graft vinyl type polymerizable units onto the photocleavable centre, consisting of grafting the vinyl function included in a molecule comprising at least one reactive function (F1) onto the chemical skeleton of the photocleavable centre, and also comprising at least one other reactive function (F2), by causing

these two functions (F1, F2) to react to form a β -hydroxyester bond through attack by a carboxylate anion on an oxirane under conditions of nucleophilic catalysis, ~~more particularly~~ in the presence of catalysts carrying tertiary amino or quaternary ammonium groups.

86. (allowed - currently amended) ~~Method~~ A method for preparing a bifunctional monomer of oligomer or prepolymer size as in claim 77, ~~characterized in that~~ in which function A being a carboxylic acid function and function B an alcohol or amino function, the polycondensation or polyaddition reaction of the precursor monomers of AB₂ or AB₃ type is conducted in the presence of dehydrating agents.

87. (allowed - currently amended) ~~Method~~ The method as in claim 86 ~~characterized in that~~, wherein the dehydrating agents are chosen from among: 1-methyl-2-chloropyridinium iodide, dicyclohexylcarbodiimide, N,N'-diisopropylcarbodiimide, N,N'-carbonyldiimidazole, 1,1'-carbonylbis(3-methylimidazolium) triflate, di-2-pyridyl carbonate, 1-hydroxybenzotriazole, an acylation agent of Pyridine/Tosyl Chloride type or SOCl₂/DMF.

88. (allowed - currently amended) ~~Method~~ A method for preparing a bifunctional monomer of oligomer or prepolymer size as in claim 77, ~~characterized in that~~ in which function A being an ester function and function B an alcohol or amino function, the transesterification reaction of the precursor monomers of AB₂ or AB₃ type is ~~preferably~~ conducted in the presence of catalysts ~~such as~~ comprising one selected from the group consisting of titanates, organic tin oxides and

esters, using basic catalysis in the presence of non-ionic bases providing soft operating conditions ~~such as~~ optionally comprising amines, amidines, guanidines, triamino(imino)-phosphoranes.

89. (currently amended) ~~Use~~ A method of using ~~of the~~ photosensitive adhesive composition as in claim 39 for various clinical applications in the area of dentistry, ~~in particular to bond~~ elements to the surface of teeth and/or to seal tooth cavities.

90. (currently amended) ~~Bifunctional~~ A bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, ~~characterized in that it~~ wherein said bifunctional monomer is of oligomer or prepolymer size and has a comb branched structure consisting of a principal linear polymer chain of which each of the comb branches contain at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned on the free end of the branch, the photocleavable units being chosen from the 2-nitrobenzyls defined in claim ~~47-39~~ 39 by formula 1.

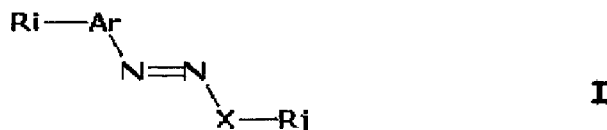
91. (currently amended) ~~Bifunctional~~ A bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and

positioned either side of the cleavage site or sites of said photocleavable centre, ~~characterized in that it~~wherein said bifunctional monomer is of oligomer or prepolymer size and has a comb branched structure consisting of a principal linear polymer chain of which each of the comb branches contain at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned on the free end of the branch, the photocleavable units being chosen from the 2-nitrobenzyls defined in claim ~~48-39~~39 by formula 2.

92. (new) A photosensitive adhesive composition of polymerizable resin type whose hardening is obtained by polymerization and/or cross-linking characterized in that said composition contains:

- at least one chain polymerization reaction initiator that ensures hardening of said composition, and
- a sufficient quantity of at least one bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit selected from the group consisting of:

(i) aryl-diazos units defined by formula I:



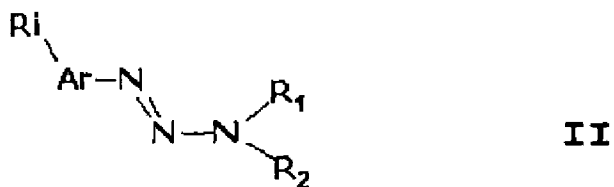
in which:

- Ar designates an aromatic system, monocyclic or polycyclic, carbocyclic or heterocyclic,

- X designates an atom chosen from among: C,O,P,S;
- Ri is one or more of the following groups: hydrogeno, halogeno, alkyl linear or branched, saturated or unsaturated, optionally substituted, aryl aromatic or heteroaromatic, substituted or unsubstituted, alkoxy comprising at least one selected from the group consisting of methoxy, ethoxy, aryloxy, alkylthio, arylthio, benzyl, halogeno, hydroxy, hydroxyalkyl, thiol, alkoxy carbonyl, aryloxy carbonyl, cyano, carbonyl, formyl, amino, carboxylic and sulfonic ester, carboxylic sulfonic and phosphoric amide, carboxylic sulfonic and phosphoric acid, sulfonate, phosphonate, $-OCONR'R''$ group, $-OCO_2R'$, $-OSO_2R'$, $-OPOOR'OR''$, $-R'NHCOOR''$, $-R'OCO_2R''$, $-NR'R''$ (in which R' and R'' represent an alkyl group, carbocyclic or heterocyclic group, aliphatic, unsaturated, (hetero-)aromatic group, all substituted or unsubstituted, imine whether substituted or not, nitro, $-N=N-R'$, $-R_p-Si-(OR_q)_3$ group (in which R_p is a hydrocarbon chain or a linear alkyl chain comprising at least 3 C atoms, and R_q denotes a hydrogen atom, a hydroxy group, C₁-C₆ alkoxy chain or - (Si(OR_q) group), vinyl group, acrylic group, alkoxy carbonyl group, and an aryl triazene group,

- Rj designates one or more substituents depending upon the valency of the atom designated by X, the same or different and chosen from among: an alkyl chain linear or branched, saturated or unsaturated, acyclic or cyclic, optionally substituted; an aromatic or heteroaromatic group including, at least one nitrogen or sulfur atom, monocyclic or polycyclic; an alkoxy, aryloxy chain or benzyl group;

(ii) aryl-triazene units defined by formula II:

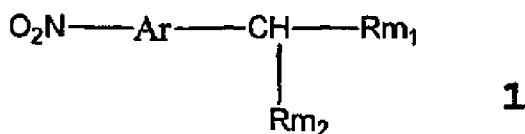


in which:

- Ar designates an aromatic system monocyclic or polycyclic, carbocyclic or heterocyclic,
- Ri is chosen from among the following groups: alkyl linear or branched, saturated or unsaturated, optionally substituted, aryl aromatic or heteoaromatic, substituted or unsubstituted, alcoxy comprising one selected from the group consisting of methoxy, ethoxy, aryloxy, alkylthio, arylthio, benzyl, halogeno, hydroxy, hydroxyalkyl, thiol, alkyloxycarbonyl, aryloxycarbonyl, cyano, carbonyl, formyl, amino, carboxylic and sulfonic ester, carboxylic sulfonic and phosphoric amide, carboxylic sulfonic and phosphoric acid, sulfonate, phosphonate, $-\text{CONR}'\text{R}''$ group or $-\text{OCO}_2\text{R}'$, $-\text{OSO}_2\text{R}'$, $-\text{OPOOR}'\text{OR}''$, $-\text{R}'\text{NHCOOR}''$, $-\text{R}'\text{OCO}_2\text{R}''$, $-\text{NR}'\text{R}''$ (in which R' and R'' represent an alkyl group, a carbocyclic or heterocyclic group, aliphatic, unsaturated, a (hetero-)aromatic group, all substituted or unsubstituted, imine substituted or unsubstituted, nitro, $-\text{N}=\text{N}-\text{R}'$, $-\text{Rp}-\text{Si}-(\text{ORq})_3$ group (Rp and Rq as previously defined above), a vinyl group, acrylic group, alcoxycarbonyl group, and an aryltriazene group,
- R_1 and R_2 are chosen independently from one another, a $-\text{N}=\text{N}-\text{R}'$ group, $-\text{NR}'-\text{N}=\text{N}-\text{R}''$ group, OH group, $\text{NR}'\text{R}''$ group, (R' and R'' have the previously given denotations), an alkyl group comprising at least

one selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, tert-butyl, an alcoxy group substituted or not, a benzyl group, a (hetero)-aromatic group, all substituted or not by substituents of Ri type, a hydroxyethyl, cyanoethyl, aminoethyl, acryloxyethyl, and halogenoethyl group

(iii) 2-nitrobenzyl units having the formula 1:



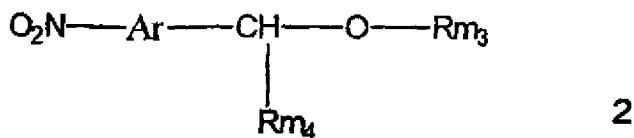
in which:

- Ar designates an aromatic or heteroaromatic radical monocyclic or polycyclic and carrying at least one Rk substituent,
- Rk designates an auxochromic or bathochromic substituent which may be chosen from the following examples: hydrogen, halogen, alkyl chain, aliphatic acyclic saturated or unsaturated, linear or branched, a cyclic, aliphatic, unsaturated, aromatic or heteroaromatic radical, these chains and radicals possibly being substituted, interrupted or terminated by a heteroatom comprising at least one selected from the group consisting of B, N, O, Si, P, S and a halogen, a nitro group, cyano group, an alcoxy, aryloxy, alkylthio, arylthio, benzyl, alylalkyl, hydroxy, thiol, alkyloxycarbonyl, aryloxycarbonyl, carbonyl, formyl, amino radical, carboxylic ester, amide, sulfonic ester, sulfonic amide, carboxylic acid, sulfonic acid, sulfonate, phosphonate, a -OCONR'R'' group, -OCO₂R', -OSO₂R', -OPOOR'OR'', -R'NHCOOR'', R'OCO₂R'', NR'R'' (R' and R'' are an alkyl,

aryl group, a carbocyclic or heterocyclic group), imine substituted or unsubstituted, diazo $-N=N-R'$, $-Rp-Si(ORq)_3$ group (Rp and Rq as defined in claim 3), alkylglycidyl ether, alkylvinyl ether, cyclohexyl epoxy,

- R_{m1}/R_{m2} are independently chosen from among: a hydrogen, an alkyl, alkenyl, alcyanyl, alkylaryl chain, all substituted or unsubstituted, a carbocyclic or heterocyclic chain saturated or unsaturated, aromatic or heteroaromatic, substituted or unsubstituted, an alkoxy, aryloxy, alkylthio, arylthio chain, an alkyloxocarbonyl group, $-NR'COR''$ group, $-OCOR'$ group, $-OCOOR'$ group, $-OCONR'R''$ group, $NR'COOR''$ group, $-OPOR'R''R'''$ group, $-OSO_2R'$ group, $-OPOOR'OR''$ group, $-NR'R''$, $-COOR'$ group, $-CONR'R''$, $SOOR'$, $-COR'$ group (R' , R'' and R''' have the previously indicated denotations for R' and R''), an imine group substituted or unsubstituted, a hydroxy, thiol group, a carboxylic acid or derivative of carboxylic acid, a halogen, a nitrile, an alkyl(C1-C6)glycidyl ether group, alkyl(C1-C6)vinyl ether group, cyclohexyl epoxy, $-Rp-Si-(ORq)_3$ group (Rp and Rq as previously defined above)

(iv) 2-nitrobenzyl units defined by formula 2:

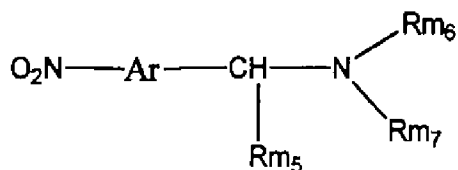


in which:

- Ar is as defined in claim 9,
- R_{m4} is defined as R_{m1}/R_{m2} in claim 9,

- R_{m3} is chosen from among a hydrogen, an alkyl, alkenyl, alcyanyl, alkylaryl chain, all substituted or unsubstituted, interrupted by a heteroatom, a carbocyclic or heterocyclic chain, saturated or unsaturated, aromatic or heteroaromatic, substituted or unsubstituted, an alkyloxocarbonyl group, $NCOOR'$ group, $-POR'R''R'''$ group, $-SO_2R'$ group, $-POOR'OR''$ group, $-COOR'$ group, $-CONR'R''$, COR' group (R' , R'' and R''' having the previously indicated denotations for R' and R'' in claim 9), an alkyl(C_1-C_6)glycidyl ether group, alkyl(C_1-C_6)vinyl ether group, cyclohexyl epoxy, $-Rp-Si(ORq)_3$ group (Rp and Rq as previously defined above),

(v) 2-nitrobenzyl units defined by formula 3:



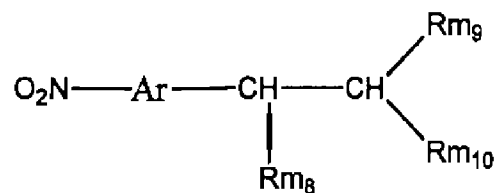
in which:

- Ar is defined as previously,

- R_{m5} is defined as $R_{11}/R_{12}/R_{13}$,

- R_{m6}/R_{m7} are defined as a hydrogen, an alkyl, alkenyl, alcyanyl, alkylaryl chain, substituted or not, interrupted by a heteroatom, a carbocyclic or heterocyclic chain, (un)saturated, (hetero)-aromatic, substituted or not, an alkyloxycarbonyl group, $-R'COR''$ group, $R'COOR''$ group, $R'R''$, $-COOR'$ group, $-CONR'R''$, a COR' group (R' and R'' having the denotations previously given), a hydroxy group, alkyl(C_1-C_6)glycidyl ether or alkyl(C_1-C_6)vinyl ether, cyclohexyl epoxy, $-Rp-Si(ORq)_3$ group (Rp and Rq as defined previously above), and

(vi) 2-nitrobenzyl units defined by formula 4:



in which:

- Ar is defined as previously,
- $\text{R}_{\text{m}8}/\text{R}_{\text{m}9}/\text{R}_{\text{m}10}$ are defined as $\text{R}_{11}/\text{R}_{12}/\text{R}_{13}$ as defined above; and

secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre so that said hardened composition loses its integrity and adhesiveness under the action of uncrosslinking radiation which causes cleavage of the photocleavable units,

wherein the initiator for chain polymerization reaction(s) are photoinitiating means consisting of at least one photoinitiator able to initiate the polymerization reaction mechanism under the action of crosslinking radiation whose wavelength λ_1 is different to wavelength λ_2 for uncrosslinking radiation,

said composition further comprises at least two types of complementary vinyl units, capable of creating a charge transfer complex (electron donor/acceptor pair) itself able to initiate a radical reaction under the action of crosslinking radiation of wavelength λ_1 , or at least one type of acceptor vinyl unit able to create a charge transfer with another complementary species.

93. (new) The adhesive composition as in claim 92, wherein the donor vinyl unit is chosen from among the elements: styrene, vinyl acetate, vinyl ether, exomethylene dioxolane, 4-methylene-2-phenyl-1,3-dioxolane, alkyl methacrylate, vinyl pyrrolidone, vinyl carbazole, vinyl naphthalene, while the vinyl unit of acceptor type is chosen from among the elements: maleic anhydride, acrylonitrile, diethyl fumarate, fumaronitrile, maleimides.